

MICROMETEOROLOGICAL MEASUREMENTS AND DATA MANAGEMENT AS TRANSFERRABLE SKILLS



ABSTRACT

More often than not, we are system thinkers. We think of things as systems, as interconnected sets of elements that are organized to fulfill a purpose. Applying a systematic process of understanding how entities influence one another within a whole for a specific purpose can help us find solutions to challenges ranging from climate change to geopolitics.

We applied the system thinking method to the micrometeorological data-related knowledge and skill enhancement plan within the framework of the CA20108 FAIRNESS Cost Action. Specifically, we incorporated the results of the enhancement plan into the micrometeorological data-related transferrable skill enhancement (TSE) system in order to test the hypothesis, confirm the anticipated results, and identify the new driving and restoring factors (endogenous and exogenous), delays, shifting dominance in feedback loops and leverage points.

INTRODUCTION

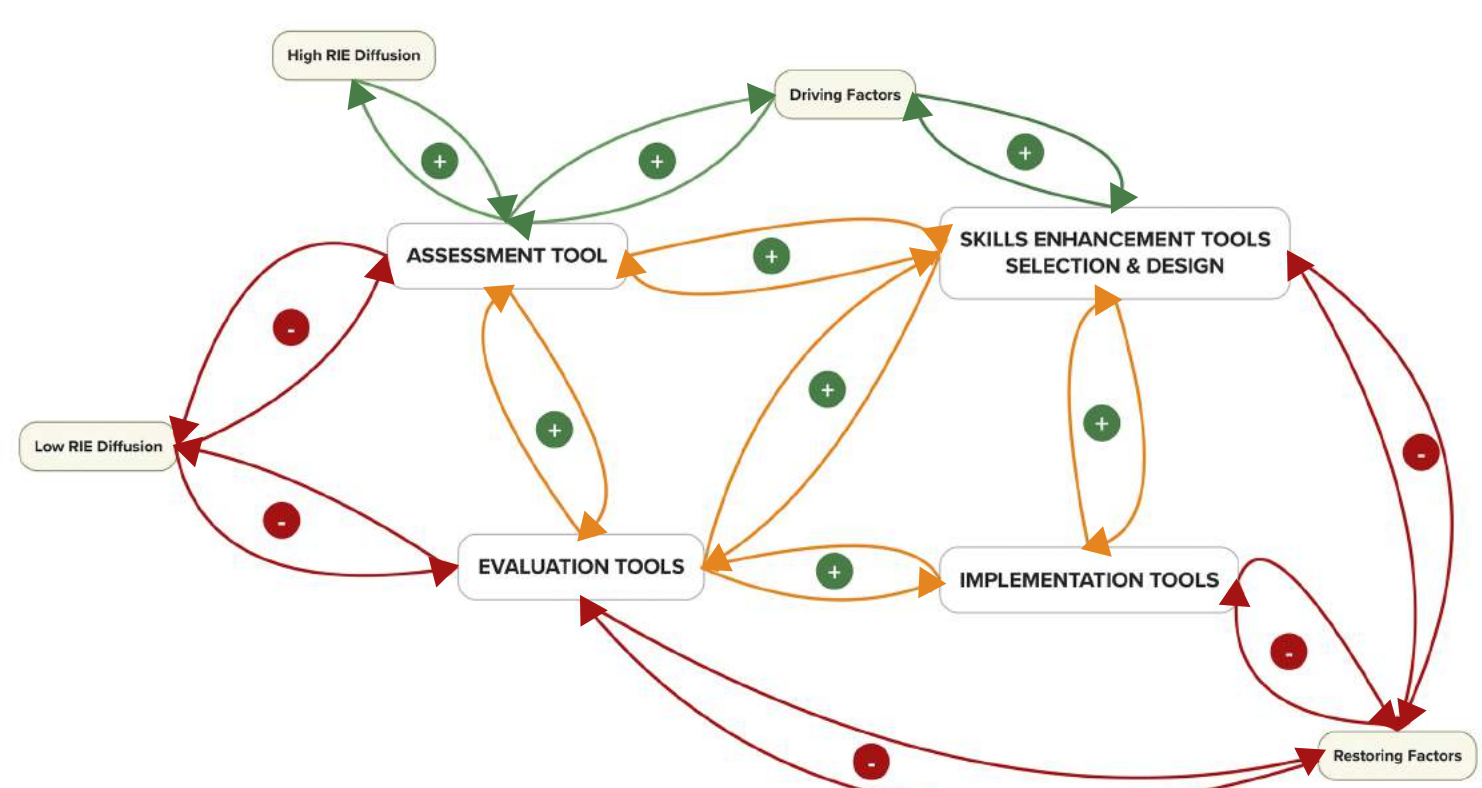
In a fast-changing global economy, knowledge and skills play a crucial role in determining individual, institutional, and societal competitiveness, as well as the capacity to drive innovation. However, businesses currently face major knowledge and skills gaps. But do these gaps relate to soft, hard, or transferable knowledge and skills?

Transferable skills can be used in many jobs and can be hard and soft. Soft transferable skills are commonly considered to be time management, communication, teamwork, leadership, and interpersonal skills. Sometimes the difference between hard and soft transferable skills includes the level of proficiency.

SYSTEM STRUCTURE AND BEHAVIOR

Following the knowledge and skill enhancement plan, we identified the main elements of our system: assessment tools, skill enhancement tools, implementation tools, and evaluation tools. The system elements are interconnected in the way to achieve its purpose: the enhancement of micrometeorological data-related transferrable skills (Figure 1).

Figure 1 Elements, interconnections and driving/restoring factors of the TSE structure



Assessment. A transferable skills questionnaire is used to assess the current status of micrometeorological measurements and data management skills. This is meant to help teachers and trainers design personalized training programs.

Skill enhancement tools selection and design combine good practices from education and technology training and, when organized for a broader audience, will be a combination of lectures, demonstrations, and hands-on training. For smaller groups, training will involve more specific skill enhancement focusing on select topics.



Implementation tools.

The following tools are selected and designed for implementation: i) summer schools, ii) workshops (typically on multiple topics), iii) specialized meetings (one topic) for in-person skill enhancement, iv) FAIR micrometeorological platform, v) video materials and podcasts, and vi) a guideline: "Guideline for future good practices in micrometeorological measurement methods, data assimilation and indices" in a form suitable for beginners and users without previous knowledge in micrometeorological measurements.



I.i I.ii II III IV V VI

Evaluation tools include include i) a questionnaire on participants' opinions, ii) a questionnaire on trainers'/teachers' opinions regarding selected tools and implementation, iii) a questionnaire on organizer's opinion regarding the presented lectures/training and participant involvement, iv) the users' response to the Guideline, v) follow up activities and/or results, vi) the number of guideline downloads and citations..

The **interconnections** among system elements - presented as inflows and outflows in Figure 1 - are driven by both endogenous and exogenous driving and restoring factors. While some of these affect flows directly, others act as factors driving drivers. We will assume that there are no destructive elements within the system, but that some of the flow rate decreases can have an endogenous explanation.

DRIVING FACTORS IDENTIFIED

The **driving factors** include

- a) end-users needs;
- b) stakeholders demands;
- c) R&I knowledge and skill database (can be both endogenous and exogenous); and
- d) general public expectations (exogenous)

The **restoring factors** include

- a) low rate of information inflow to the system from end-users, stakeholders, and R&I knowledge and skill database;
- b) lack of incentives and voluntary work of end-users, stakeholders, and R&I community (COST action financing);
- c) lack of research, innovation, and expertise diffusion;
- d) costs of implementation.

RESULTS

As of July 10th, 2023, 147 participants from 40 countries answered a transferable skills self-assessment survey. The majority of participants were the age of students or early career scientists (Figure 2). Their self-assessment indicates a relatively low level of micrometeorological data-related transferrable skills (Figure 3), a high motivation to increase their transferrable skills (Figure 4), and a relatively high status of existing transferrable skills (Figure 5).

Figure 2 Age composition of assessment participants

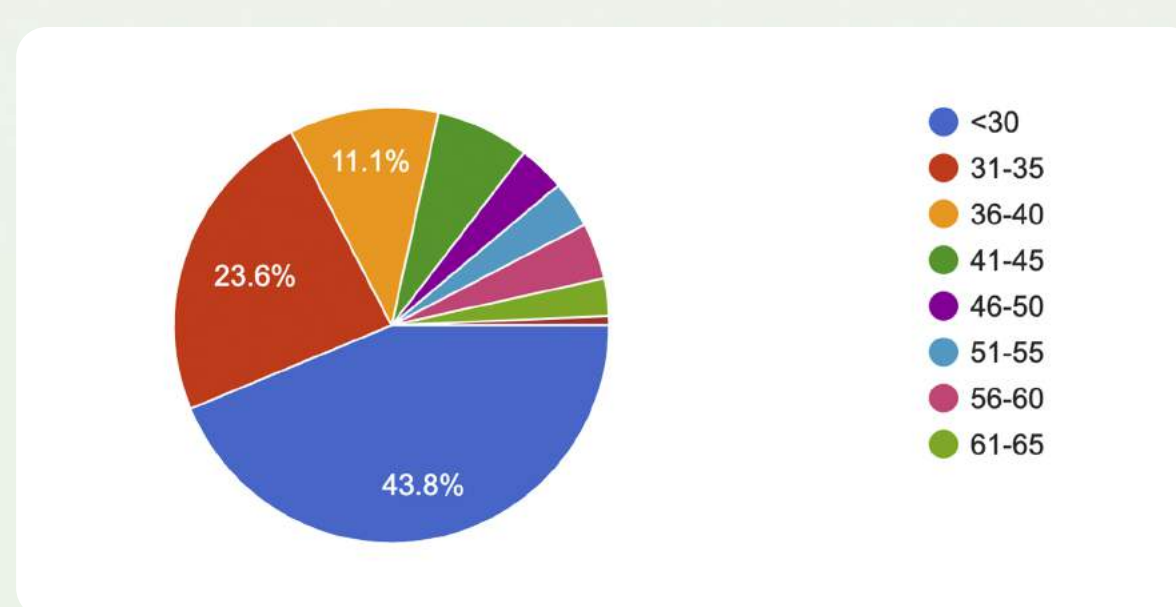


Figure 3 Current status of micrometeorological data-related skills of participants [self-assessment]

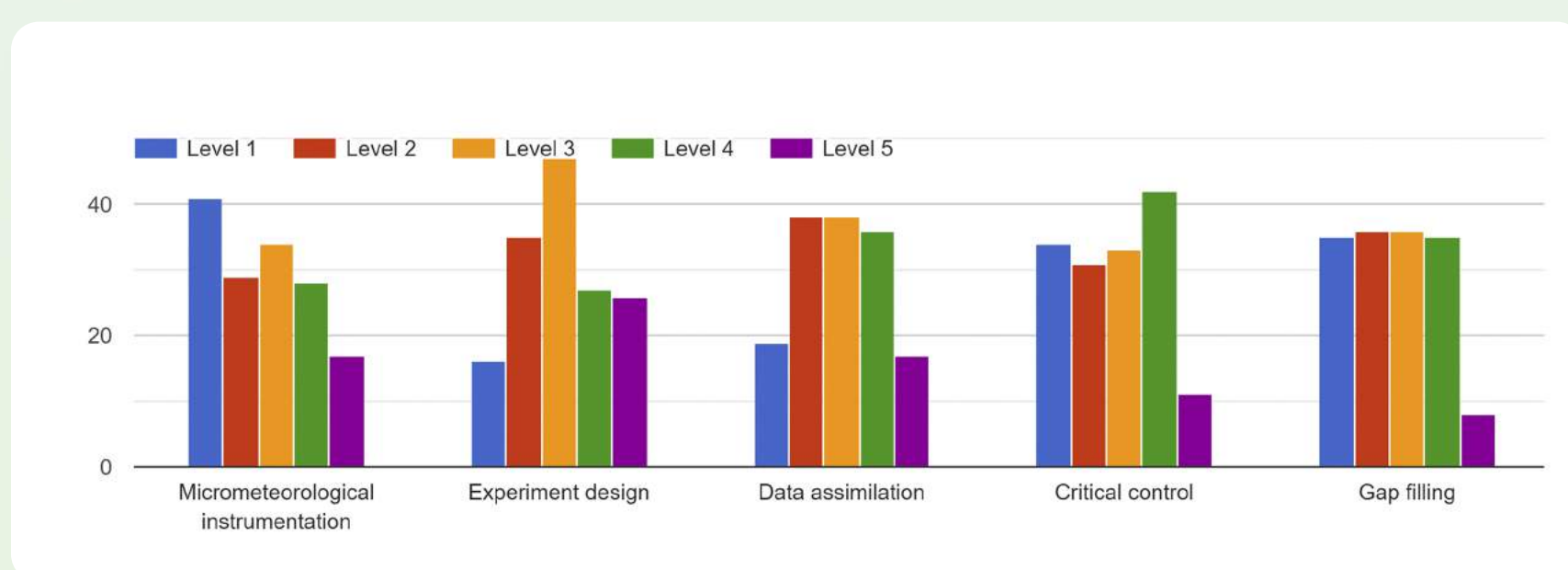


Figure 4 Participants interest in skill enhancement

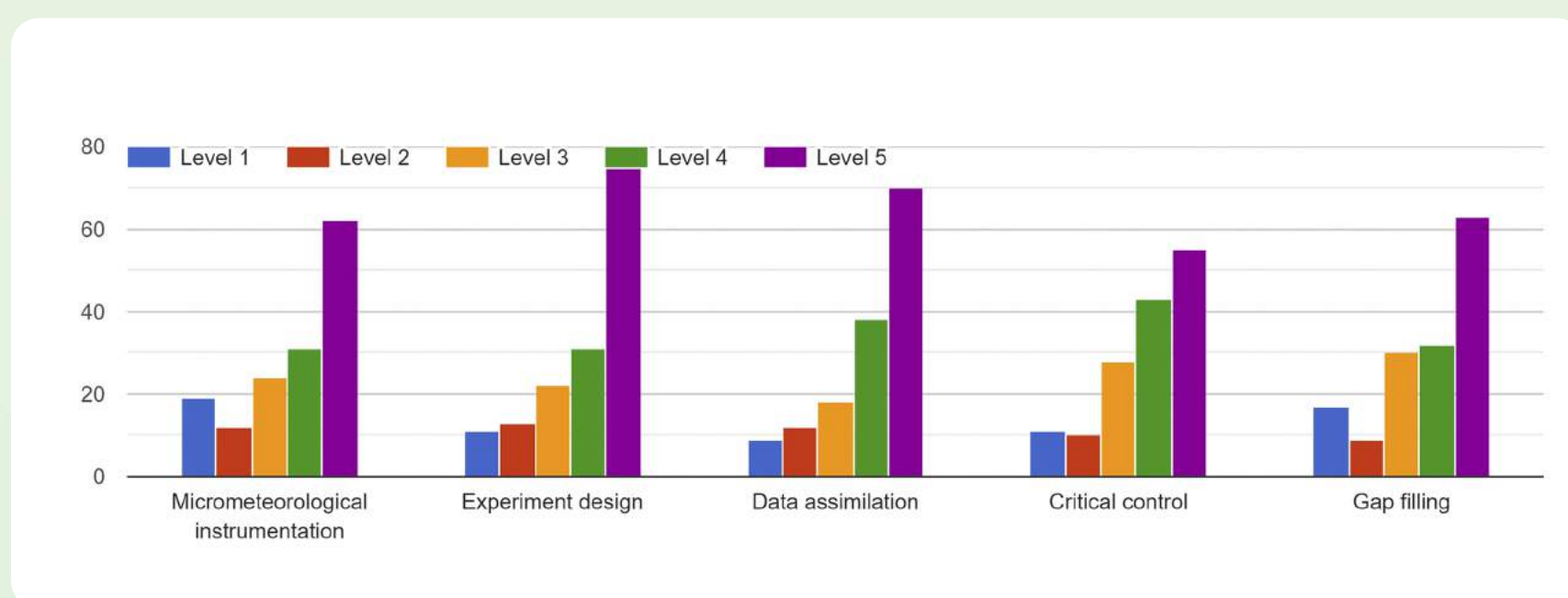
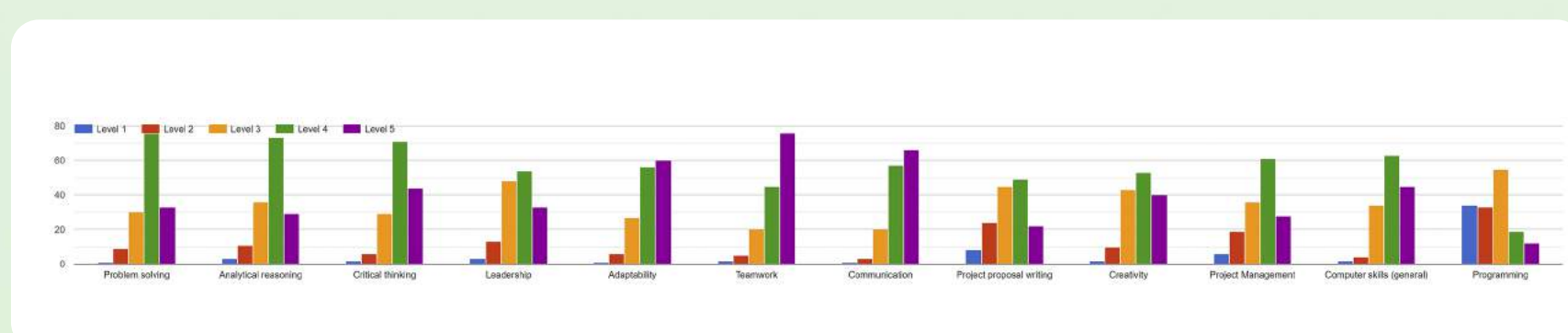


Figure 5 Current status of typical transferrable skills of participants [self-assessment]



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